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USSR

Comments on Soviet Science and Scientists

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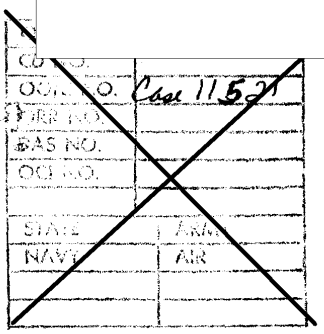

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This report contains the considered opinions of a group of perhaps a dozen very competent chemists and physicists who read and evaluate Soviet literature in their special fields. The source summarized the differing views expressed in order to present as fair a picture as possible.

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1. It is difficult to comment on the statements made about Soviet science because the answers depend almost entirely on the amount of political interference with science in the USSR. However, history strongly indicates that there is a priori no reason to believe that the Soviets are incapable of developing great scientists. They have had outstanding scientists in the past and there are a few today, particularly in the field of physics. Twenty-five pictures of outstanding Soviet scientists were featured in the 23 Oct 44 issue of Life Magazine.

2. In mathematics, starting about 1830 with Lobatschevsky, there have been a number of first-class Soviet mathematicians. The University of St Petersburg (Leningrad) and the University of Warsaw have brought forth an outstanding group of mathematicians, the first university excelling in number theory and statistics, and the latter in topology. Some of the best mathematicians in the US, for instance, S Lefschetz of Princeton and Uspensky of Stanford, are pupils of this school. Kolmogorow, the leading Soviet mathematician, is usually considered as one of the most brilliant contemporary mathematicians.

3. In the field of nuclear physics, Joffe and Frenkel have done outstanding work in quantum theory and atomic physics. Mandelstam at Moscow found the Raman effect at about the same time as Raman, only his publication date is later.

4. In the field of optics, Ignatovsky, who lived and studied for a long time in Germany, started a school in Leningrad which deals with problems of diffraction in optical systems. Slyussareff, a young Soviet scientist, has taken up the neglected field of the analytical study of optical systems. The Optical Institute in Leningrad has a large group of outstanding scientists (Vavilov in spectroscopy, Linnik in interferometric analysis, Slyussareff in geometrical

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optics). In the last ten years a sizable group of articles and books have been published, especially in the field of precalculation of optical systems, methods which probably have not received sufficient attention in the Western world.

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5. At this time the [redacted] is translating an excellent book by Slyussareff and [redacted]-page book by Volisow published in 1948 which deals with the design of optical systems. 50X1

6. In the field of chemistry before the Soviet revolution, the contributions of Mendelejew are well known. Madame Curie, while of Polish nationality, has a Soviet background and there is not much difference racially between the Soviet and the Polish people.

7. The older reputable organic chemists, Ipatieff, Chichibabin, and Ostromuislenskii, escaped from the country at the time of revolution when it became obvious that their usefulness would be curtailed or ended. Only Lebedev remained, which suggests that he must have adopted whatever beliefs were advanced. His work was always good. In our opinion there are no newer or younger organic chemists who even approach the above "masters" which is not surprising, considering the handicap under which they would have to work.

8. USSR, in overrunning neighboring countries, acquired a few organic chemists, Dziewonski, Ostrogovich, and Bena-Median, whose work in the heterocyclic field was previously reliable. Also, Porai-Koshits (antecedents unknown to us) works in the field of heterocyclics.

9. The main fields of investigation in chemistry seem to be with the aliphatics (petroleum hydrocarbons, dienes, acetylenes) and the heterocyclics. It is difficult to assess the quality of the output without repetition of the work, and its originality is subject to question in some instances because USSR recognizes no rules or laws regarding copyrights and patents. Minor contributions have been made to the aromatic series of compounds, either in fundamental research or in the development of dyes.

10. The work of Peter Kapitza in physical chemistry, notably in the study of low temperatures and the electrical properties of matter, is well known.

11. While it appears that USSR is not producing a great amount of outstanding scientific work at this time, we feel this is primarily due to politics and not because of a lack of native ability on the part of the Soviets. Also it is often speculated that most available men with any sort of scientific training are completely occupied in attempting to adapt known processes to and maintain production for current needs inside USSR. Political dogmatism has all but destroyed the sciences of biology, economics, and sociology in USSR, and it would appear that in time such an attitude would destroy the other sciences as well.

12. Historically, science based on theory and experimentation came through the ancient Greek culture and flourished in the Western world in France, Germany, Italy, England, and the Low Countries. The Soviets have produced some great scientists but not the large number produced in Western civilizations since the Renaissance. However, all races of mankind (except the Stone Age cultures of groups such as occur in Australia, New Guinea, and parts of Africa) have developed a high level of what we call civilization. History teaches that in the recurring rise and fall of civilizations, while involving and dependent on conditions affecting the whole population, the start of each fluctuation is primarily the result of actions taken by a very few individuals. Similarly, the science and technology of a cultural group depends on only a few individuals. For instance, a few Edisons, Firestones, Fords, Eastmans, Einsteins, Maxwells, De Forests, Newtons, etc, can provide enough scientific discoveries and technological inventions to keep large populations busy for

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many years developing and improving their ideas and inventions. The cultural group referred to as USSR obviously is by no means sterile and in such a large group of this type, it can be almost stated as a law that a few outstanding individuals will develop. There are strong indications that the Soviets now realize that they almost ruined their science and technology after the Bolshevik Revolution and are trying to regain this loss, notably by using German nationals. It seems to us that this approach can be successful.

13. Also, it seems to us to be of some importance to note that perhaps the greatest scientific weakness in USSR is the lack of the proper application by native Soviets of science and scientific methodology, namely, technology and engineering, to industry. The reasons for this are undoubtedly complex, but they seem in some measure to stem from the generally low standard of living. A low standard of living usually results in the lack of sufficient impetus in the majority of the people to build things and thus native engineering abilities appear relatively low. Also, political philosophy probably has a profound effect on the ordinary Soviet's attitude toward engineering in the same way it affects science. In other words, it is similar to the old comparison of "beating the horse or leading him with a carrot."

14. It might be of interest that in our discussions with some of the staff, it was believed that the Soviets would suffer a great deal more than the Western world, should scientific intercourse between the two areas become non-existent. On the other hand, the following comment by another staff member is of interest: "Let us not forget that it is not very many years ago that Germany was without a peer in the field of organic chemistry and that even we were largely aping their efforts, and did so for a good many years. Strangely enough, only after the isolation from this highly developed scientific field caused by World War I did we actually develop our own creativeness in the field of organic chemistry, and this has grown rapidly since then."

15. In general, then, it is our feeling that the Soviets at the moment are "apers" in the main but with some outstanding exceptions (particularly in mathematics and physics). There is, however, always the strong possibility that they can improve their scientific and technological position. It seems to us that a great number of scientists and technologists could result if education were made available or forced on the large population in USSR, if political influence became much less repressive, and if a suitable system of economic reward became effective. Furthermore, we think we should expect that science and technology might improve quite rapidly in USSR, whether or not we severed all intercourse with that country.

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